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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/531,516
Filing Date: April 15, 2005
Appellant(s): ETZOLD, PETER

Michael J. Striker
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/20/2007 appealing from the Office action mailed 7/9/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,617,007	Keidl et al.	4-1997
20020109485	Wu	8-2002
5,459,652	Faulk	10-1995
6,434.025	Shiral et al.	8-2002
5,345,094	Usui et al.	9-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is the Final Office action that has been sent out on 7/9/2007.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-12, 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keidl et al. ('007), in view of Wu (US PG Pub No. 20020109485, hereinafter '485).

For claims 1 and 9, '007 teaches a method for operating a line-supplied charger (10) (Fig. 1) (col. 3, lines 1-40) for a battery (14) in a maintaining mode for keeping the battery in a charged state, in which the battery (14) alternates cyclically (e.g., the float charging phase, Fig. 3; Fig. 2E) between a resting phase (e.g., the zero current period of the float charging phase) and

a refreshing phase (e.g., the current IX period of the float charging phase), in which the battery (14), in the resting phase (e.g., the zero current period of the float charging phase), from self-discharging of the battery (6) (i.e., during the zero current period of the float charging phase the battery discharges including through the battery self-discharging), discharges from an upper threshold voltage (Vf ***1.01**) to a lower threshold voltage (**Vf***0.99) which is lower than the upper threshold voltage but is preferably higher than the rated voltage of the battery (Fig. 2E); and in which the battery (14), in the refreshing phase (e.g., the current IX period of the float charging phase), is charged again from the lower (**Vf***0.99) to the upper threshold voltage (Vf ***1.01**) via a charge transformer (36) of the charger (10) (step 274, Fig. 2E); wherein individual components the charger (10) comprising at least the charge transformer (e.g., the charging circuit including 36 and 32), are switched off from the line voltage (VIN) during the resting phase (e.g., the zero current period of the float charging phase)(Step 266, Fig. 2E)

For claim 9, '007 teaches a charger (10)(Fig. 1) (col. 3, lines 1-40) for charging a battery (14) from a line voltage (VIN), including:

a charge transformer (36 and 32) for transforming the primary line voltage (VIN) into a secondary voltage;

a rectifier, which is connected downstream of the charge transformer (36)(e.g., the BRIDGE and the transformer XFRM in the 36) (col. 3, lines 35-36) on its secondary side, for furnishing a charging voltage for the battery from the secondary voltage;

and a control unit (Fig. 1; Fig. 2E; col. 3, 30-40) for triggering the rectifier (36) via a control signal [e.g., the output of (34)] in response to the charging voltage, in particular in such a way that the battery (14), after its charging phase, is kept in its charged state in that the battery

(14) alternates cyclically (e.g., the float charging phase, Fig. 3) between a resting phase (e.g., the zero current period of the float charging phase), in which the battery from self-discharging of the battery (i.e., during the zero current period of the float charging phase the battery discharges including through the self-discharging) discharges from an upper threshold voltage (Vf *1.01) to a lower threshold voltage (Vf*0.99) which is lower than the upper threshold voltage but greater than the line voltage of the battery (e.g., the charger is structurally capable to be programmed by the microprocessor 12 to meet the limitation), and a refreshing phase (e.g., the current IX period of the float charging phase), in which the battery (14) is charged again from the lower to the upper threshold voltage (Vf *1.01) via the charge transformer (36) of the charger (10)(Fig. 1, 2E, 3; col. 3, lines 1-40);

characterized by a first comparator for generating a first comparison signal (e.g., it is implemented by the microcomputer in the step 284; Fig. 2E), when the battery voltage at the end of the refreshing phase has reached or exceeded the upper threshold voltage (Vf *1.01)(e.g., the charge is structurally capable to perform the function for monitoring the battery voltage through 16, 18 and compare with the upper threshold voltage by microprocessor 12; Fig. 1, 2E, 3; col. 3, lines 1-40);

and a switching device (32) for switching off at least the charge transformer (1), during the resting phase (e.g., the zero current period of the float charging phase), from the line voltage (VIN) in response to a switching signal (charge on/off), which represents the first comparison signal (Fig. 1, 3; col. 3, lines 30-40; col. 2, lines 63-67).

'007 does not explicitly teach that the charge transformer is decoupled or separated from the input power source of the line voltage (AC) during the resting phase (e.g., the zero current

period of the float charging phase). However, disconnect a charge transformer from the input power source such as an A.C. main line is well known in the art. For example, in an analogous art, '485 teaches a battery charging device (Fig. 2; Abstract) which use a switch (SW1) to decouple (disconnect) the charge transformer (1) from the A.C power line (Fig. 2) during the charging off phase. '485 further teaches that the charging circuit is actuated through SW1 during the conductive time period for charging the battery, and the supply of the current to the battery is ceased during the non-conductive time period [0032][0025]. Therefore, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a switch to separate the charge transformer from the A.C line input during the resting mode and connect the A.C line to the charge transformer during the charging mode in the charging method of '007, as taught by '485, in order to have charged the battery, because '485 has demonstrated that it is a suitable method in order to have charged the battery.

Claim 2, '007 teaches the limitations of claim 1 as discussed above. It further teaches that the charge-maintaining mode (e.g., float charging phase, Fig. 3; Fig. 2E), the alternation from the resting phase (e.g., the zero current period of the float charging phase) to the refreshing phase (e.g., the current IX period of the float charging phase) takes place whenever the battery voltage has reached or undershot the lower threshold voltage (**Vf***0.99) (step 274, Fig. 2E).

Claim 3, '007 teaches the limitations of claim 1 as discussed above. It further teaches that the battery (14) is charged with a predefined constant charging current during the refreshing phase (e.g., the current IX period of the float charging phase, Fig. 3).

Claim 4, '007 teaches the limitations of claim 1 as discussed above. It further teaches that in the charge-maintaining mode (e.g., the float charging phase, Fig. 3), the alternation from

the refreshing phase (e.g., the current IX period of the float charging phase) to the resting phase (e.g., the zero current period of the float charging phase) is effected whenever the battery (14) has been charged to the upper threshold voltage (Vf*1.01) or above it (step 266, Fig. 2E).

Claim 5, '007 teaches the limitations of claim 1 as discussed above. It further teaches that the charge-maintaining_mode is preceded by a charging mode (e.g., the constant current charging phase and the constant voltage charging phase of Fig. 3; Fig. 2B), in which the battery (14), in a first phase, is charged preferably with a constant current to the upper threshold voltage and, in a second phase, is supplied with a constant charging voltage (e.g., the constant voltage charging phase, Fig. 3; Fig. 2C; Fig. 2D).

Claim 6, '007 teaches the limitations of claims 1 and 5 as discussed above. It further teaches that an alternation from the second phase of the charging mode to the charge-maintaining mode, in particular to the resting phase (e.g., the zero current period of the float charging phase), takes place when the upper threshold voltage has been maintained with the aid of the constant charging voltage, and simultaneously the charging current has dropped to a predetermined value that is less than the value of the constant current in the first phase (see the constant voltage charging phase, Fig. 3; steps 260-264, Fig. 2D).

Claim 7, '007 teaches the limitations of claim 1 as discussed above. It further teaches that a computer program provided on a data medium and computer-readable by a battery charger, the computer program have a program code that is embodied for performing the method according to claim 1 (e.g., the charge is a microcomputer (12) based which is inherently program saved on some type of data medium as per flow-chart in Fig. 2)(col. 3, lines 6-8).

For claims 8, '007 teaches the limitations of claim 1 and 7 as discussed above. It further teaches that a data medium that is computer-readable by a battery charger and having a computer program according to claim 7 [Note (col. 3, lines 6-8) which describes the microprocessor 12 is suitably programmed to perform the method as illustrated and described with respect to FIGS. 2A-2E. While not explicitly stated as carried by a computer readable medium, the code must inherently encoded on a computer readable data medium, since it would be impossible for the program to operate in the manner described in (col. 3, lines 6-8), and elsewhere in the reference, absent being embodied on or in some form of computer readable medium].

For claim 9, '007 teaches a charger (10)(Fig. 1) (col. 3, lines 1-40) for charging a battery (14) from a line voltage (VIN), including:

a charge transformer (36) for transforming the primary line voltage (VIN) into a secondary voltage;

a rectifier, which is connected downstream of the charge transformer (36)(e.g., the BRIDGE and the transformer XFRM in the 36) (col. 3, lines 35-36) on its secondary side, for furnishing a charging voltage for the battery from the secondary voltage;

and a control unit (Fig. 1; Fig. 2E; col. 3, 30-40) for triggering the rectifier (36) via a control signal [e.g., the output of (34)] in response to the charging voltage, in particular in such a way that the battery (14), after its charging phase, is kept in its charged state in that the battery (14) alternates cyclically (e.g., the float charging phase, Fig. 3) between a resting phase (e.g., the zero current period of the float charging phase), in which the battery from self-discharging of the battery (i.e., during the zero current period of the float charging phase the battery discharges

including through the battery self-discharging) discharges from an upper threshold voltage (Vf *1.01) to a lower threshold voltage (Vf*0.99) which is lower than the upper threshold voltage but greater than the line voltage of the battery (e.g., the charger is structurally capable to be programmed by the microprocessor 12 to meet the limitation), and a refreshing phase (e.g., the current IX period of the float charging phase), in which the battery (14) is charged again from the lower to the upper threshold voltage (Vf *1.01) via the charge transformer (36) of the charger (10)(Fig. 1, 2E, 3; col. 3, lines 1-40);

characterized by a first comparator for generating a first comparison signal (e.g., it is implemented by the microcomputer in the step 284; Fig. 2E), when the battery voltage at the end of the refreshing phase has reached or exceeded the upper threshold voltage (Vf *1.01)(e.g., the charge is structurally capable to perform the function for monitoring the battery voltage through 16, 18 and compare with the upper threshold voltage by microprocessor 12; Fig. 1, 2E, 3; col. 3, lines 1-40);

and a switching device (32) for switching off at least the charge transformer (1), during the resting phase (e.g., the zero current period of the float charging phase), from the line voltage (VIN) in response to a switching signal (charge on/off), which represents the first comparison signal (Fig. 1, 3; col. 3, lines 30-40; col. 2, lines 63-67).

'007 does not explicitly teach that the charge transformer is decoupled or separated from the input power source of the line voltage (AC) during the resting phase (e.g., the zero current period of the float charging phase). '485 reads the same obviousness as discussed in claim 1 rejection above.

Claim 10, '007 teaches the limitations of claim 9 as discussed above. It further teaches that a second comparator for generating a second comparison signal (e.g., it is implemented by the microcomputer in the step 272; Fig. 2E), when the battery voltage at the end of the resting phase has reached or undershot the lower threshold voltage (Vf*0.99)(e.g., the charger is structurally capable to perform the function for monitoring the battery voltage through 16, 18 and compare with the upper threshold voltage by microprocessor 12 with proper software; Fig. 1, 3; col. 3, lines 1-40)(col. 2, lines 63-67).

Claim 11, '007 teaches the limitations of claims 9 and 10 as discussed above. It further teaches that an OR logic module for furnishing the switching signal (CHARGER ON/OFF) for the switching device (32) as an OR linkage from the first and the second comparison signals [e.g., the OR module function as defined in papa 0015-0016 is implemented in the sequential steps (step 284 and step 272 in particular) of the flow chart Fig. 2E, and carried out by the microprocessor 12].

Claim 12, '007 teaches the limitations of claims 9-11 as discussed above. It further teaches that the two comparison signals are synchronized with one another in such a way that upon generation of the first comparison signal, the second comparison signal is also converted to a state such that the switching signal (32) at the output of the OR logic module assumes a state which opens (i.e., the switch 10 is opened when it is switched off) the switching device (10) [e.g., the synchronization function is implemented in the sequential steps of the flow chart Fig. 2E, and carried out by the microprocessor 12].

Claim 16, '007 teaches the limitations of claim 9 as discussed above. It further teaches that the control unit, the first and second comparators, and/or the OR logic module (180) are

realized as an integrated circuit, preferably as a microcontroller or microprocessor (12) with a suitable computer program [e.g., the program is inherently exist in order for the microprocessor (12) to perform the sequential steps of the flow chart Fig. 2E] (col. 2, lines 63-67).

Claim 17, '007 teaches the limitations of claim 9 as discussed above. It further teaches that the comparators (step 284; Fig. 2E) are embodied by analog hardware (col. 2, lines 63-67)(col. 6, lines 10-11).

3. Claims 13-14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keidl et al. ('007), in view of Wu ('485), further in view of Faulk (US Patent No. 5,459,652, hereinafter '652).

For claims 13-14, '007 and '485 teach the limitations of claim 9 as discussed above. '007 and '485 do not explicitly teach that a supply transformer (36) for supplying the control unit (2,3,4), on its secondary side, with a supply voltage. '007 and '485 do not explicitly teach that the supply transformer is connected downstream of the switching device (32) and with its primary side is connected parallel to the charge transformer (36).

However, in an analogous art, '652 teaches a power supply (Fig. 3; Abstract) which uses a supply transformer (42)(46) on the secondary side of transformer (28) and at the downstream of the switching device (32) with a boot strip circuit (82, 90) to supply a voltage to the switching control circuit (36). It further teaches that by using the circuit for the powering the control circuit of the switching power supply in order to assure low power during normal operation and safe operation all times (Abstract).

Therefore, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the supply transformer circuits

(42)(46) with the boot strip circuit (82, 90) of '652 to power the charging control unit of the switching power supply charging transformer of '007 and '485, as taught by '652, in order to have assured low power during normal operation and safe operation all times, because '652 has demonstrated that it is a suitable method in order to have assured low power during normal operation and safe operation all times.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keidl et al. ('007), in view of Wu ('485), further in view of Faulk ('652), and further in view of Shiral et al. (US Patent No. 6,434.025, hereinafter '025).

For claims 13-15, '007 '485, and '652 teach the limitations of claim 9 and 13 as discussed above. '007, '485, and '652 do not explicitly teach that the supply transformer is connected upstream of the switching device and is coupled with its primary side to the line voltage (AC). However, in an analogous art, '025 teaches a switching power supply (Fig. 13; Abstract) using a supply transformer (101, 102) to power the control circuits. '025 teaches that the supply transformer (101, 102) is connected upstream of the switching device (Tr1, Tr2), and is coupled with its primary side to the line voltage (AC). It further teaches that by using the supply directly from the AC for powering the control circuit it can fail-safe monitor not only an excessive power supply output, but also for an abnormal drop in output level (Abstract). Therefore, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the supply transformer (101, 102) of '025 to power the charging control unit of the switching power supply charging transformer of '007, '485, and '652, as taught by '025, in order to have fail-safe monitored not only an excessive power supply output, but also for an abnormal drop in output level, because '025 has

demonstrated that it is a suitable method in order to have fail-safe monitored not only an excessive power supply output, but also for an abnormal drop in output level.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keidl et al. ('007), in view of Wu ('485), further in view of Usui et al. (US Patent No. 5,345,094, hereinafter '094).

For claim 18, '007 and '485 teach the limitations of claim 9 as discussed above. "007 does not explicitly teach that the switching device of the charger is embodied as an opto-triac. However, in an analogous art, '094 teaches a power device which includes both optical triac and an output-stage triac in one substrate. It further teaches that the power device can be used as a power controller to control a high AC voltage and large current (col. 1, lines 25-66).

Therefore, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the optical triac as the switching device of the charging system of '007 and '485, as taught by '094, in order to have controlled the high AC voltage and large current of the charging system, because '094 has demonstrated that it is a suitable method in order to have controlled the high AC voltage and large current by using the optical triac as the power switch.

(10) Response to Argument

1) <u>Appellant Argue:</u>

a. Appellant argued on page 5, first paragraph and page 6 copied below

Independent claims 1 and 9 are not obvious over the combination of the Keidl et al and Wu references.

> Keidl neither discloses nor suggests any kind of charge-maintaining mode during part of which the charging transformer is completely turned off for keeping the battery in a charged state after the charging process. By turning off the charging transformer, the self-discharging effects of the battery are significantly reduced almost to zero.

Examiner Responds:

Examiner respectfully disagree appellants above arguments.

It is clear from looking at the Keidl reference (see figure 1, 3 below with Examiner's highlight) that keidl does discloses ***a line-supplied charger*** (10) ***for a battery*** (14)(Fig. 1) ***in a maintaining mode*** ***for keeping the battery in charging state*** (i.e., in the charging mode the battery voltage is maintained between V*1.01 and V*0.99)(Fig. 3), ***in which the battery alternates cyclically between a resting phase*** (i.e., R as highlighted by examiner) ***and a refreshing phase*** (i.e., A as highlighted by examiner).

It is also noted that in the resting phase (R) the battery charging current supplied by the line voltage through the Transformer 36) is turned off to zero as indicated in the lower curve which represents the Battery Charging Current.

Examiner further point out that the Appellant's argument "By turning off the charging transformer, the self-discharging effects of the battery are significantly reduced almost to zero" is not in the claimed limitations of claims 1 or 9.

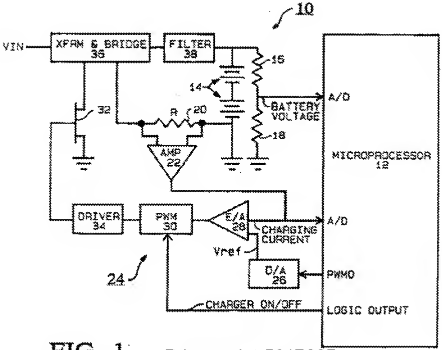
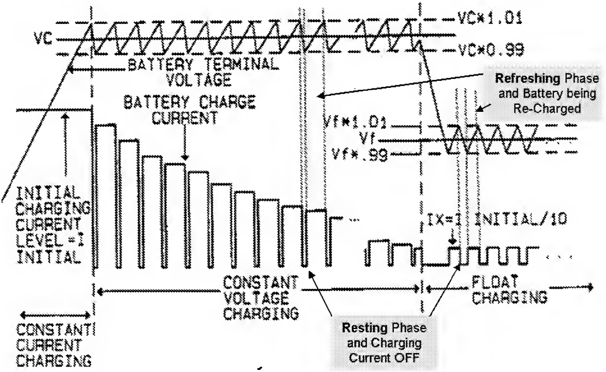


FIG. 1 Primary Art 5617007

FIG. 3



b) Appellant further argued on page 6, second and third paragraphs as copied below:

The process disclosed in Keidl differs from the process shown in the diagram only in that a two-point switch is used for controlling the charging current during the float voltage charge (phase 3).

Therefore, the Appellant respectfully submits that Keidl only discloses a method for operating a line-supplied charger for a battery, in which during a charging mode, the battery, in a first phase, is charged with a constant current to
the upper threshold voltage and, in a second phase, is supplied with a constant charging voltage. This, however, has only very little to do with the present invention, which relates to the charge-maintaining mode following the charging mode, during which the charging transformer is completely turned off for most of the time, so-called "saw tooth maintaining charging".

Examiner Responds:

Examiner respectfully disagree appellants above arguments.

As indicated above as well as in the Final Rejection, Keidl does discloses the claimed limitations of claims 1 and 9. Furthermore, the argument of "*the charging transformer <u>is completely,</u> or <u>not completely,</u> turned off for most of the time* " is not in the claimed limitations of the claims 1 or 9.

c) Appellant further argued on page 7, second and third paragraphs copied below

The charger disclosed in Keidl comprises a switching device (FET 32). However, the switching device (32) only serves for activating and/or deactivating the charging circuit (24). In particular, the switching device (32) cannot separate the charge transformer (36) from the line voltage (VIN). Therefore, even if the float voltage charge phase of the three phase charging process disclosed in Keidl could be regarded as a charge-maintaining mode in the sense of the present invention, Keidl still would not anticipate the subject matter of independent claims 1 and 9 in their entirety, because the

transformer (36) of the Keidl charger (10) in the stand-by mode during the phase three is not decoupled from the rest of the circuit of the charger and still consumes a considerable amount of energy, leading to a relatively fast self-discharging of the battery. This is avoided with the present invention.

Examiner Responds:

In response to appellant's above argument, one of ordinary skill in the art would recognize that when a battery charger is turned off during the zero charging current as disclosed by Keidl, the secondary side (i.e., the output side) of the charging transformer would be electrically interrupted or separated implicitly from its primary side of the voltage which provided the charging energy from the line voltage of the AC main.

And as further indicated in the Final Rejection, even though Keidl does not explicitly disclose how to separate the secondary side of the charger from the line voltage on its primary side during the resting period for cutting off the charging current to zero, it would be obvious to one in the art at the time of invention to have use a switch to separate a input line voltage through a switch, since it is known in art to have used a switch in order to have cutoff the battery charging current during the zero charging current period, as demonstrated by Wu (US PG Pub. 20020109485) in the Fig. 2 and paragraph [0020] as copied below:

As it is clear to be seen that during the non-conductive period the charging current is interrupted by turn off the switch through 22 and the charging circuit can be separated from the AC power source by controlling the switch SW1 [0020] for stopping the charging current during the Non-Conduction period (i.e., during the period the battery charging current is turned off to zero).

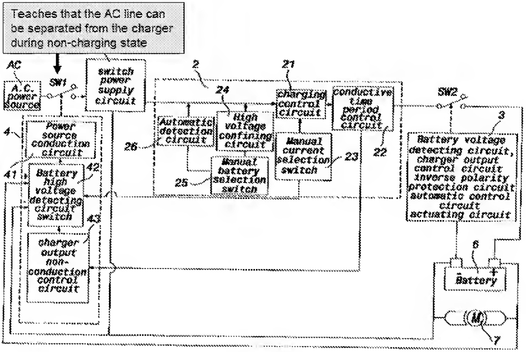


FIG. 2

Secondary Art 20020109485

[0020] <u>The conductive time period control circuit 22 is to control the length of time span of conductive and non-conductive time periods.</u> During the conductive time periods, the battery 6 is charged under the constant current or voltage operation mode. In the end of every conductive time period, the voltage of the battery 6 will be detected, for the purpose of entering another conductive time period or not. <u>In other words, when the voltage of the battery 6 at the full-charge level, the A.C. power source is cut off automatically, and, if not reached to the full-charge level yet, the battery charging process resumes during the next conductive time period.</u>

d) Appellant further state:

Therefore, even if the float voltage charge phase of the three phase charging process disclosed in Keidl could be regarded as a charge-maintaining mode in the sense of the present invention, Keidl still would not anticipate the subject matter of independent claims 1 and 9 in their entirety, because the transformer (36) of the Keidl charger (10) in the stand-by mode during the phase three is not decoupled from the rest of the circuit of the charger and still consumes a considerable amount of energy, leading to a relatively fast self-discharging of the battery. This is avoided with the present invention.

Examiner would respectfully point out that even though that the transformer (36) of the Keidl charger (10) in the stand-by mode during the phase three is not decoupled from the rest of the circuit of the charger completely and still consumes an amount of energy, leading to a relatively fast self-discharging of the battery, however so does the same of the appellant's own disclosed invention, as can be seen clearly shown in Fig. 1 and 3 below:

As appellant disclosed, although the charging transformer 120 separates the secondary side from the primary side, the secondary side of the charge transformer 120 is still connected with the other circuits of the charger including 130, 160, 170 which do consume energy from battery 200 and lead self-discharging of the battery.

Fig. 1

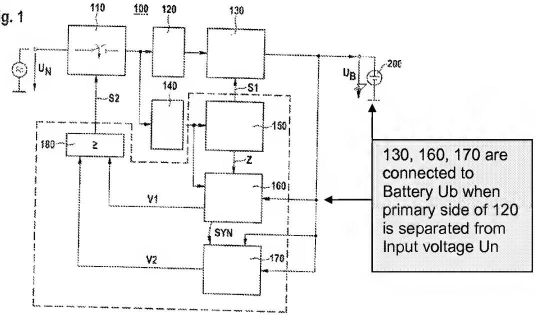
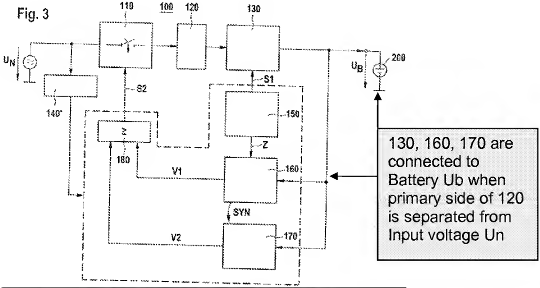


Fig. 3



Furthermore, the above argued limitation "the charging transformer is decoupled from the rest of the circuit of the charger COMPLETELY and CAN NOT consumes a considerable amount of energy, leading to a relatively fast self-discharging of the battery" is not claimed in the claims 1 or 9.

e) Appellant further argued on pages 9-11 as copied below:

Wu does not teach separating the charge transformer of all things during the resting phase of a maintaining mode for keeping the battery in a charged state.

Of course, it is known from the prior-art to separate a charge transformer at any point in time, preferably after the charging phase and as long as the battery is not charged, completely from the line voltage. The question is, however, if a person skilled in the art had a motivation to separate the charge transformer just during the resting phase of a maintaining mode. The practitioner skilled in the art would have no motivation whatsoever because neither Keidl nor Wu discloses the above feature

Examiner's response:

Primary Reference Keidl does teaches the claimed limitations of claims 1, 9, as

indicated in the Final Rejection, including the limitation "separating the charge transformer from the line voltage" implicitly, as further discussed above in the Examiner's response to Appellant Argument c of 1). The secondary reference Wu is presented in the Final Rejection for further demonstrating the obviousness in the art that a switch can be used to separate the charging circuit from the line voltage during the zero current charging periods, including the motivation for cutting off the charging current as discussed above as well as in the Final Rejection.

Examiner further points out that "separating the charge transformer of all things during the resting phase of a maintaining mode for keeping the battery in a charged state" is not claimed in claims 1 or 9.

In conclusion, it is the examiner's position that references Keidl and Wu do disclose the claimed limitations of claims 1 and 9, therefore maintaining the claim rejection of claims 1 and 9

2) Appellant further Argues on page 12:

2. Claims 13-14 are not obvious over Keidl et al in view of Wu and Faulk.

Because claims 13 and 14 depend ultimately from independent claim 9, they each include all of the features of claim 9 and therefore are patentable for the same reasons as set forth above.

3. Claim 15 is not obvious over Keidl et al in view of Wu, Faulk, and Shirai et al.

Because claim 15 depends ultimately from independent claim 9, claim 15 includes all of the features of claim 9 and therefore is patentable for the same reasons as set forth above.

4. Claim 18 is not obvious over Keidl et al in view of Wu and Usui et al.

Examiner's response:

Examiner respectfully disagree the argument because for the reasons as discussed in Response to the Appellant's Argument 1) above as well as in the Final Rejection, that references Keidl and Wu do disclose all claimed limitations of claim 9.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

JZ

Conferees:

/Bao Q. Vu/
Primary Examiner, Art Unit 2838
April 14, 2008

/David S Blum/
TQAS Appeal Specialist, TC 2800